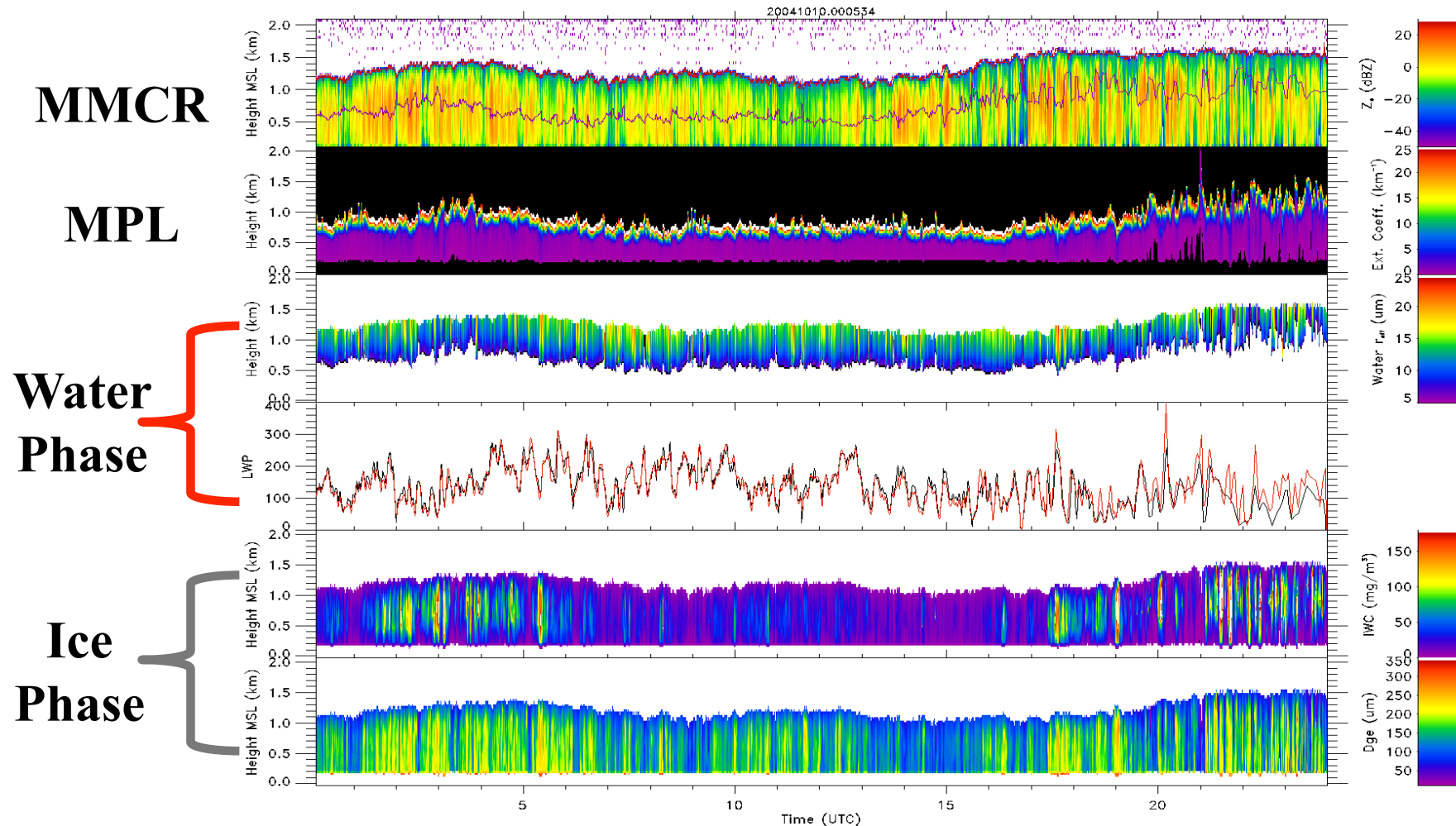


# **Observational study of aerosol-cloud interactions in arctic mixed-phase clouds: the approach and initial results**

**Zhien Wang and Ming Zhao**

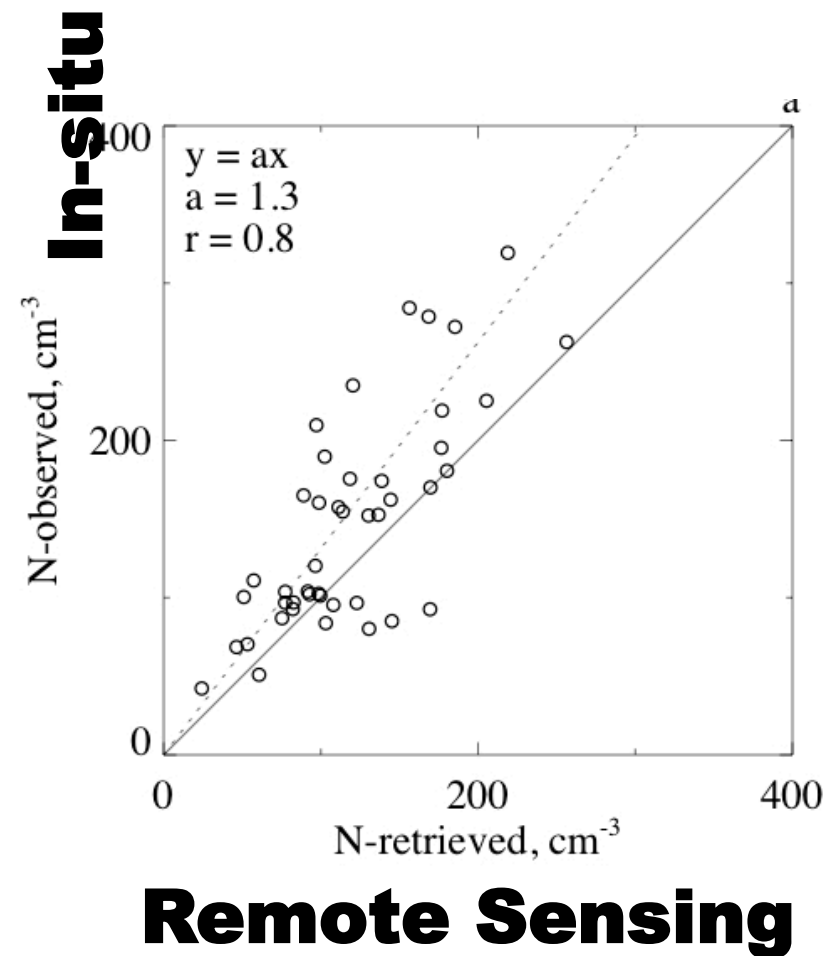
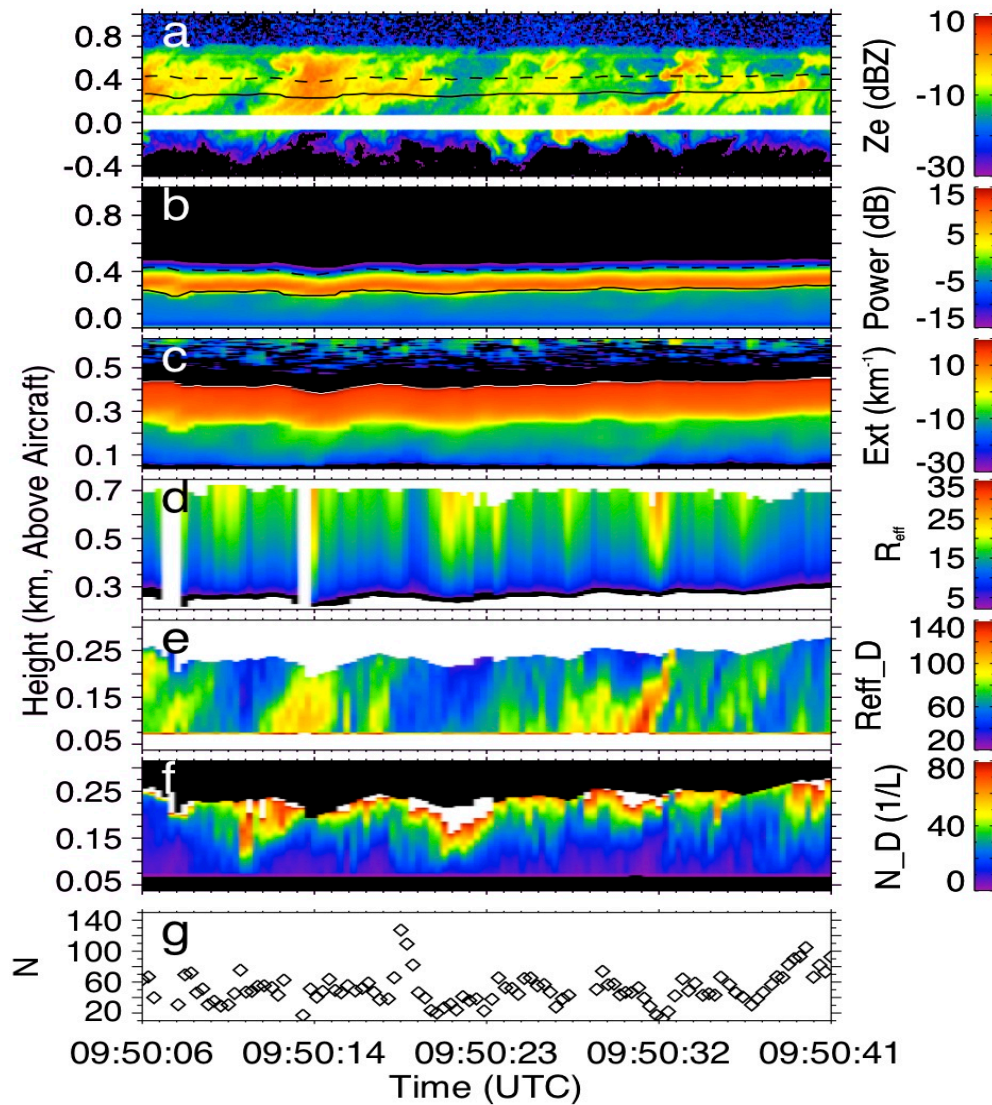
University of Wyoming

# A Mixed-phase Cloud Retrieval Example

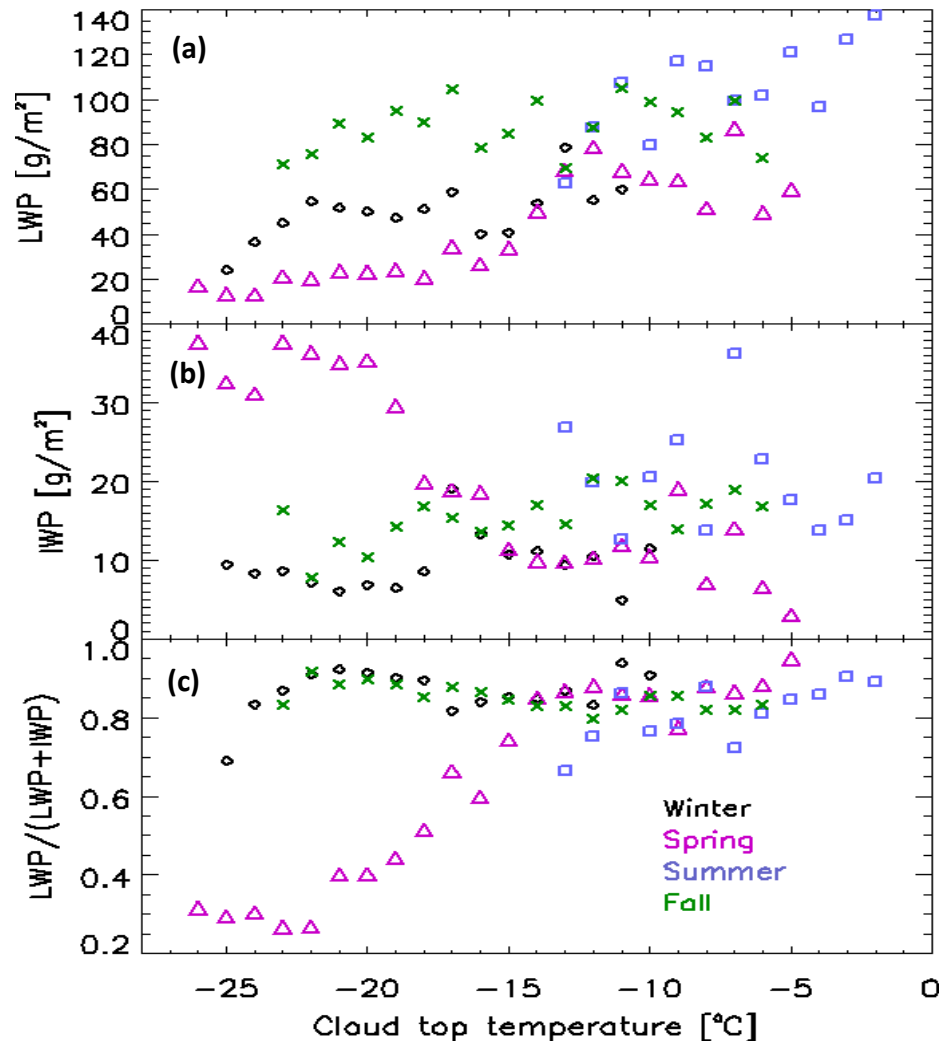


Mixed-phase clouds observed at the Barrow site on 10 October 2004 by combining MMCR, MPL, MWR, and radiosonde data. Cloud top temperature  $\sim -13.3$  °C. - Wang and Zhao, 2007

# WCL+WCR for stratiform water cloud with drizzle (based on VOCALS)

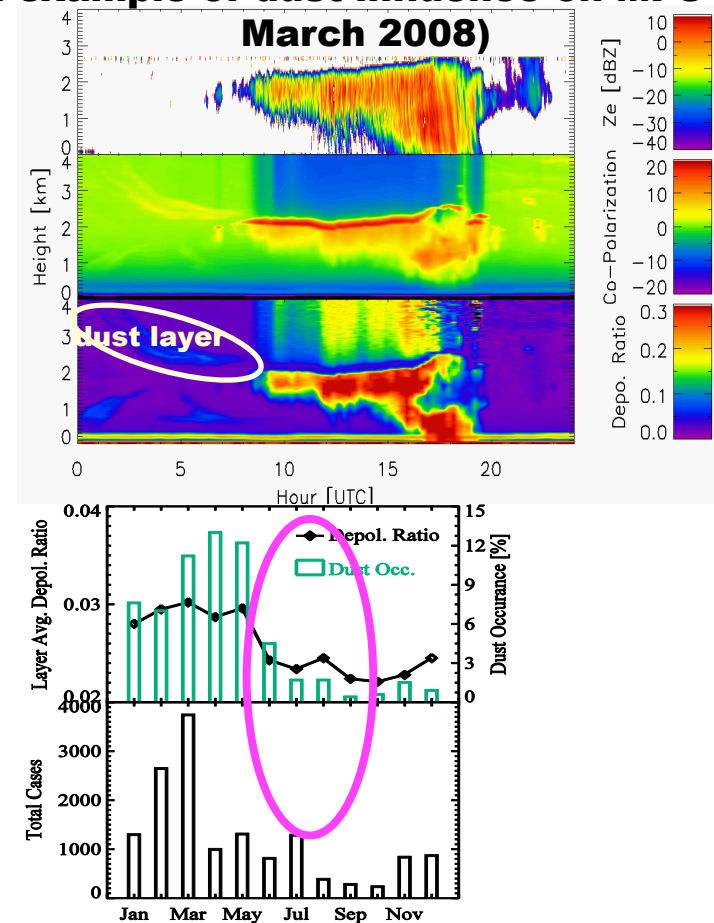


# Liquid water fraction (LWF) as function of temperature and possible dust impacts

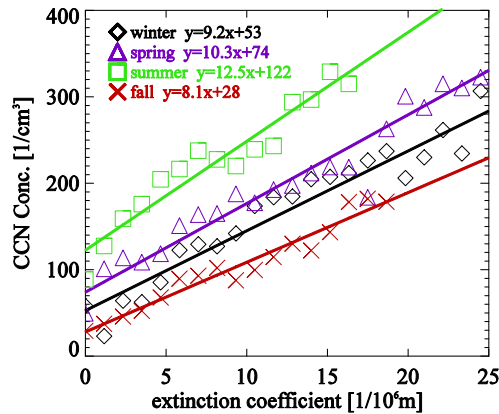
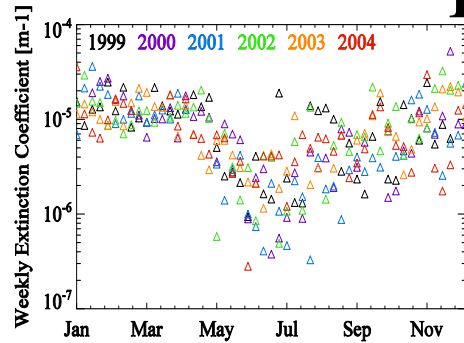


$$\text{LWF} = f(\text{temp}, ?)$$

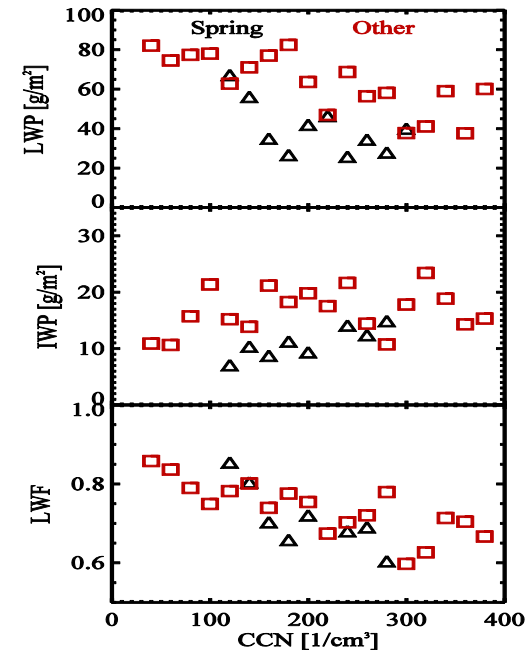
An example of dust influence on MPS (29 March 2008)



# Influence of CCN concentration on the liquid-ice mass partition



**Based on 2007-2008**



- LWP decreases trend with the increase of CCN
- IWP increases trend with the increase of CCN
- LWF decreases with the increase of CCN

# Cloud longwave radiative forcing at surface and the impact of IWP

